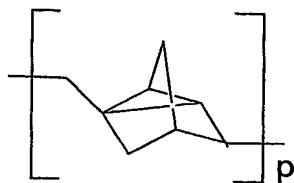
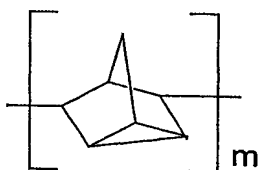
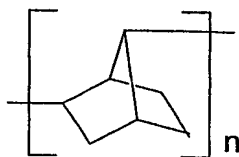


## CLAIMS

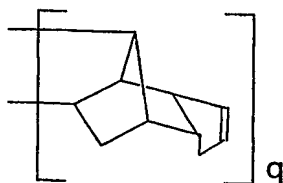
What is claimed as the invention is:

What is claimed is:

1. A composition of matter comprising a polyisobutylene segment and a polycycloolefin segment, wherein the polyisobutylene segment and the polycycloolefin segment form a repeating unit multiblock copolymer, wherein the polycycloolefin segment is selected from the group consisting of:

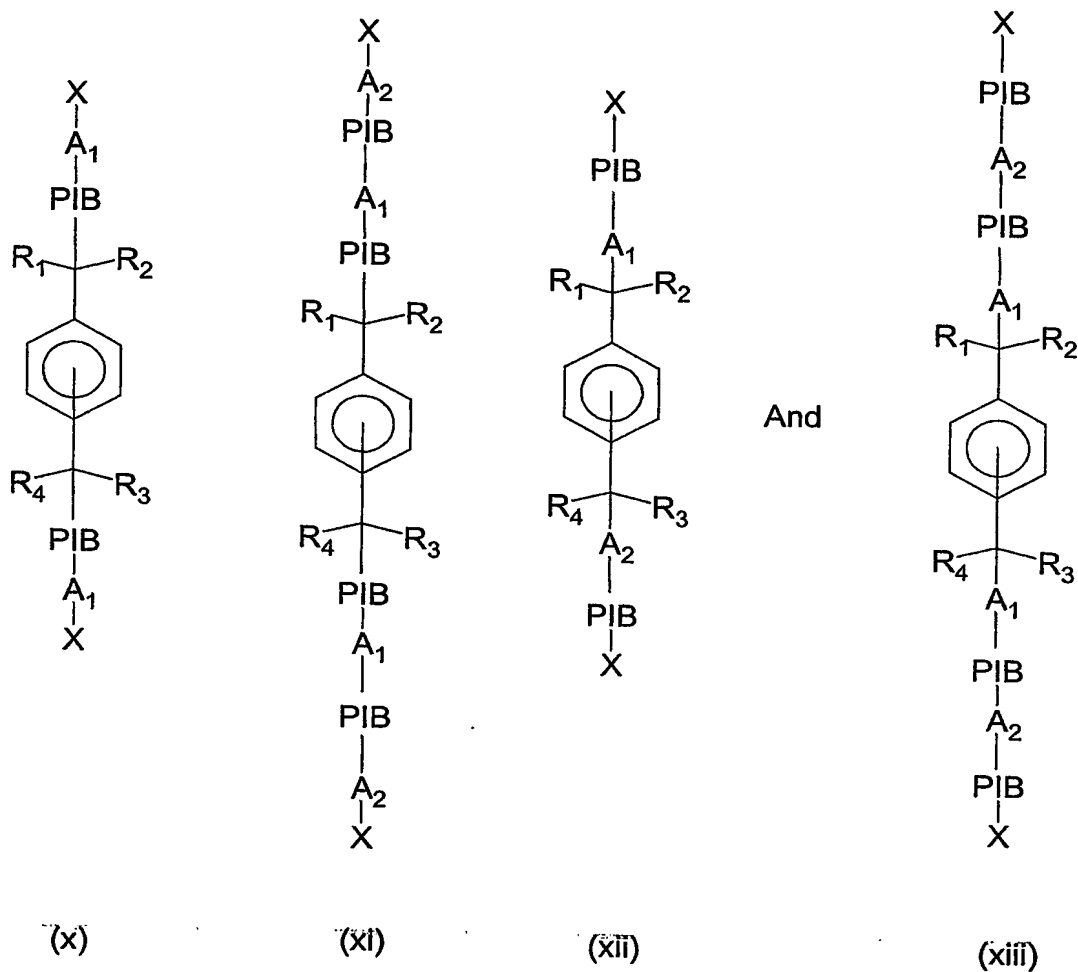


and



wherein n, m, p and q are all independently-selected integers that are at least 1.

2. The composition of matter according to claim 1 further comprising an aromatic core from which two arms extend, wherein each arm comprises the PIB segment and the polycycloolefin segment.
3. The composition of matter according to claim 2, wherein each of the arms comprises the same copolymer.
4. The composition of matter according to claim 2, wherein each of the arms is obtained by a living cationic polymerization process.
5. The composition of matter according to claim 2, wherein the composition of matter is represented by the formula selected from the group consisting of:



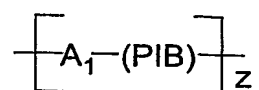
wherein A<sub>1</sub> and A<sub>2</sub> are independently-selected polycycloolefin segments;

wherein R<sub>1</sub>-R<sub>4</sub> are each independently selected from the group consisting of hydrogen, a methyl group, an ethyl group, and a phenyl group; and

wherein X is selected from the group consisting of -Cl, -Br, -OH, -OCH<sub>3</sub>, -OCH<sub>2</sub>CH<sub>3</sub>, and -OCOCH<sub>3</sub>.

6. The composition of matter according to claim 1 further comprising an aromatic core from which three arms extend, wherein each arm comprises the PIB segment and the polycycloolefin segment.

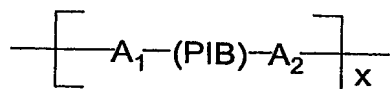
7. The composition of matter according to claim 1, wherein the polyisobutylene segment and the polycycloolefin segment are arranged according to the formula:



wherein Z is an integer that is at least 1, and

wherein A1 is the polycycloolefin segment.

8. The composition of matter according to claim 1, wherein the polyisobutylene segment and the polycycloolefin segment are arranged according to the formula:



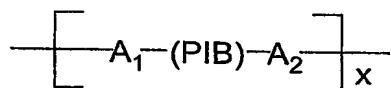
wherein X is an integer that is at least 1, and

wherein A1 and A2 are independently selected polycycloolefin segments.

9. A thermoplastic elastomer comprising the composition of matter according to claim 1.

10. An adhesive composition comprising the composition of matter according to claim 1.

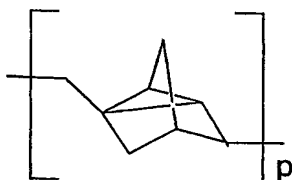
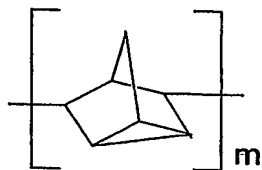
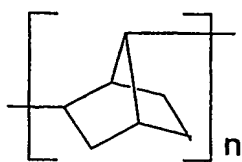
11. A coating composition comprising the composition of matter according to claim 1.
12. A method of preparing a composition of matter, the process comprising the steps of:  
 providing a bifunctional aromatic core;  
 reacting the bifunctional aromatic core with isobutylene to form a macroinitiator having two arms, said macroinitiator comprising polyisobutylene functionalized at the terminus of each arm;  
 adding a functional group to the terminus of each arm of the macroinitiator to introduce an active site capable of initiating cationic polymerization of block polymer segments at the terminus of each arm; and  
 initiating cationic polymerization to form the block polymer segments of each arm, thereby forming a multi-arm star composition of matter having multiblock copolymer arms.
13. The method according to claim 12, wherein the step of initiating cationic polymerization comprises the step of:  
 cationically polymerizing the multiblock arms, wherein the arms comprise the general



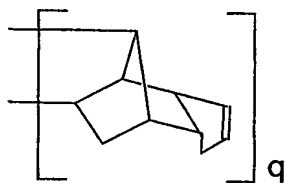
formula:

wherein PIB is a polyisobutylene segment;

wherein A1 and A2 are polycycloolefin segment independently selected from the group consisting of:



and



wherein n, m, p and q are all independently-selected integers that are at least 1.

14. The method according to claim 12, wherein the bifunctional aromatic core is a dicumyl core.

15. The method according to claim 12 further comprising the step of providing a functional group at a terminus of each arm to terminate polymerization of the arms.
16. The method according to claim 15, wherein the functional group is selected from the group consisting of  $-\text{Cl}$ ,  $-\text{Br}$ ,  $-\text{OH}$ ,  $-\text{OCH}_3$ ,  $-\text{OCH}_2\text{CH}_3$ , and  $-\text{OCOCH}_3$ .
16. A thermoplastic elastomer produced by the process of claim 11.
17. An adhesive produced by the method of claim 11.
18. A coating produced by the process of claim 11.